

targeting element uniquely distinguishing a particular polynucleotide sequence), page 7, lines 17-21 (disclosing attachment or removal of a separation group based on the nature of a distinguishing element), and page 7, lines 24-26 (disclosing selective immobilization to a solid support via an attached separation element) and page 7, 6-21 (describing first and second identification steps). No new matter has been added. An appendix showing claim amendments is attached.

Applicants submit that the claimed invention includes several features that are not described or suggested in the prior art. For example, claim 1 as amended requires two identification steps. The first corresponds to the specific hybridization of a targeting element to a target nucleic acid sequence in at least one at least one nucleic acid sequence of interest in the population of nucleic acid molecules. The second specifies that attachment of the separation group is conditional on the presence of a distinguishing element in the vicinity of the bound targeting element. The claim also specifies that it is via the attached separation group that the bound targeting element is immobilized.

The claimed invention is illustrated in the specification using an oligonucleotide as a targeting element, a biotinylated nucleotide as a separation group, and a SNP as the distinguishing element (see, e.g., page 8, lines 8-24 and page 9, lines 20-24). The oligonucleotide is designed so that it anneals adjacent to the location of the SNP in a target nucleic acid sequence. Hybridization of the oligonucleotide is the first identification step and imparts one level of selectivity.

The specification also explains that the biotinylated nucleotide is incorporated onto the bound oligonucleotide, provided the biotinylated nucleotide is complementary to a SNP of interest. Only oligonucleotides that have incorporated the biotinylated nucleotide are

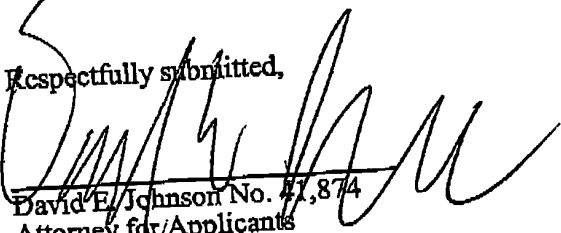
subsequently immobilized, e.g., to a streptavidin matrix. Thus, conditional attachment and subsequent immobilization of the separation group constitutes a second identification step and provides specificity in addition to that obtained by annealing of an oligonucleotide to a target sequence. The two identification steps, and the use of the second identification step for attaching a separation group that is used for subsequent immobilization of the hybridized target sequence of interest, is not described or suggested in the prior art.

Applicants submit that the application is in condition for allowance and such action is respectfully requested.

Should any questions or issues arise concerning the application, the Examiner is encouraged to contact the undersigned at the telephone number provided below.

The Commissioner is hereby authorized to charge payment of any fees required in connection with the papers transmitted herewith, or credit any overpayment of same, to Deposit Account No. 50-0311 (Reference No. 22650-001CIP).

Respectfully submitted,


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Appendix

1. (Twice Amended) A method for separating a nucleic acid of interest from a population of nucleic acid molecules, the method comprising;

providing a population of nucleic acid molecules comprising at least one nucleic acid sequence of interest, wherein said at least one nucleic acid sequence of interest includes a target nucleic acid sequence in the vicinity of a distinguishing element;

contacting said population of nucleic acid molecules with a first targeting element in a first identification step, wherein said first targeting element binds specifically to [at least one nucleic acid sequence of interest in said population of nucleic acid molecules] said target nucleic acid sequence;

selectively attaching a separation group to said bound targeting element in a second identification step, wherein attachment of said separation group is [dependent] conditional on the [nature] presence of said distinguishing element in the vicinity of said bound targeting element;

immobilizing said bound targeting element via said attached separation group to a substrate, thereby forming an immobilized targeting element-separation group complex comprising said at least one nucleic acid sequence of interest; and

removing said immobilized targeting element-separation group complex comprising said at least one nucleic acid sequence of interest from said population of nucleic acid molecules,

thereby separating said nucleic acid sequence of interest from said population of nucleic acid molecules.

19. (Twice Amended) A method for separating a nucleic acid of interest from a population of nucleic acid molecules, the method comprising;

[(a)] providing a population of nucleic acid molecules comprising at least one nucleic acid sequence of interest, wherein said at least one nucleic acid sequence of interest includes a target nucleic acid sequence in the vicinity of a distinguishing element;

[(b)] contacting said population of nucleic acid molecules with a targeting element attached to a separation group in a first identification step, wherein said [population of nucleic acid molecules comprises a] targeting element [which] binds specifically to [at least one nucleic acid sequence of interest in said population of nucleic acid molecules] said target nucleic acid sequence;

[(c)] selectively removing said attached separation group from said bound targeting element in a second identification step, wherein removal of said separation group is [dependent] conditional on the [nature] absence of said distinguishing element in the vicinity of said bound targeting element;

[(d)] immobilizing to a substrate separation groups remaining attached to said targeting element, thereby forming an immobilized targeting element-separation group complex comprising said at least one nucleic acid sequence of interest; and

[(e)] removing said immobilized targeting element-separation group complex comprising said at least one nucleic acid sequence of interest from said population of nucleic acid [sequences not containing the attached separation group] molecules, thereby separating said nucleic acid sequence of interest from said population of nucleic acid molecules.

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